

**CITY OF SAN JOSE
INFORMATION TECHNOLOGY DEPARTMENT
NCH Converged Network RPF
July 2004**

The following were considered by ITD in the NCH Converged Network RPF process:

Business considerations

1. Current City network standard
 1. Initially recommended to the Director of General Services on 3/4/99 to be Cisco for routers, switches, wireless, and network security devices
 2. Reaffirmed by the ITPB on 6/27/02 (voting membership included the Director of General Services)
 3. Working standard currently in place: all network procurements have been Cisco since the standard was set in 1999 (most even prior to that as well)
 4. In the software-based converged network environment, voice, data, and video packets are transmitted on the same network, so the network standard itself becomes the most fundamental consideration
2. City's current investment in network equipment excluding NCH
 1. \$2M+ in Cisco network assets
 - i. 100+ WAN connections that will continue to be maintained
 - ii. NOC in existing City Hall will continue to be maintained (each WAN connection has a minimum of one Cisco router at the remote site that has to be maintained in addition to existing NOC hardware that supports the WAN)
3. Strength of the City's current network standard
 1. Cisco recognized as being the market leader in enterprise IP communications
 - i. 45% of IP phone shipments worldwide in Q1 CY2004 were Cisco IP Phones (Avaya: 12%; Nortel 12%; Alcatel 9%; Mitel 7%; 3Com 4%; Siemens 2%; Spectralink 1%; NEC 1%; Sphere 1%; Other 6%; Source: Synergy Research)
 2. Cisco is recognized as the only major vendor that has a true, software-based solution that has been out on the market long enough to have a proven track record.
 - i. 14,500 customers worldwide
 - ii. More than 60% of the Fortune 500 are using Cisco IP Communications
 - iii. Cisco displacing 6,000 TDM phones every business day
 - iv. Over 3M Cisco IP phones have been sold
 3. Research conducted by ITD staff identified that, on at least two occasions, Cisco was brought in to replace existing network vendors (Denver International Airport replaced their equipment largely due to the lack of functionality. And, Electronic Arts replaced their Foundry network with Cisco because of Quality of Service issues.)

cf. Wandzia Grycz

Information Technology Department
Converged Network RFP: Considerations
July 2004

4. Cisco is the only network vendor that offers the full solution on a common network platform (switches, routers, hubs, IOS) – most vendors offer one or more components of the solution, but not the full solution
4. Staffing Impact
 1. ITD staff has declined significantly, even to a point that skilled network staff has been impacted
 2. Existing staff are supporting a common technology and architecture with Cisco
 3. City has invested in training on Cisco
 4. Training on alternative hardware is available – training on mixed networks (Cisco mixed with other network switches, routers, etc) is not available – support of a mixed environment requires vendor and staff experimentation
5. Only true Converged Network option
 1. Cisco is the leading hardware vendor capable of offering all of the components (hardware and software) to deploy the entire converged network solution; others must join with strategic partners to offer the product range (more risk to the City because more possible points of integration failure)
 2. Single hardware manufacturer/technology eliminates issues relating to compatibility
 3. By having a homogeneous hardware environment, tuning and support of Quality of Service (QoS) is much more attainable and manageable
 4. Tuning an environment that supports both voice and data is highly contingent on stability of the base solution
 5. Using Cisco network with other vendor solution for telephony creates a solution that is truly not a Converged Network but a “hybrid” solution; this type of solution consists of a Voice (Telephony) solution running over IP (Network) environment and is not a Converged Network because of tuning and management restrictions that will always exist between these two disparate systems
 6. Tuning of the disparate solution will be dependant upon the ability to keep software components in environments in synch – no telling what a software patch applied to the network will do to the telephony solution and vice versa
6. Strategic Benefits of a Converged Network Solution (see attached hard copy)

Other Considerations

1. Converged Network Alternative
 1. Assessment of risk to City associated with a “hybrid” (most of which utilize TDM or Time Division Multiplexing) solution in which the network solution would be different from the VoIP solution and potentially including equipment provided by different manufacturers) compared to a software-based converged network design: The risk is deemed Very High for the following reasons:

Information Technology Department
Converged Network RFP: Considerations
July 2004

- i. Higher risk to the City's ability to scale the solution in the future caused by a delay by either the network vendor or the VoIP vendor in the product development of proprietary interface cards that connect separate components of the network in a "hybrid" solution;
- ii. Higher total cost of ownership because of the on-going requirement to modify all the City's existing network equipment configurations as well as the configurations of "hybrid" IP equipment so they work together (integration and inter-operability)
- iii. Higher total cost of ownership because of the on-going requirement to re-establish all the modifications to all the City's existing network equipment components and the configurations of "hybrid" IP equipment components so they work together (inter-operability) every time a network upgrade is performed
- iv. Business risk to the City's of being locked into old technology by a "hybrid" solution (even though it would have been VOIP) at the core of the City's entire telecommunications network in a new facility with a probable 50-year life expectancy
- v. Business risk to City caused by not being able to easily deploy .XML applications in the future because of the old technology limitations of a "hybrid" solution (thereby reducing the time over which the City would be able to leverage its investment in the solution)
- vi. Higher cost to the City to administer and manage the "hybrid" solution (support staff would continue to be specialized in either the network or VoIP – functions could not be integrated; multiple support contracts would have to be administered)
- vii. Inability of the City to leverage existing maintenance and support staff effectively to sustain customer support levels when staffing reductions are required
- viii. Higher cost of ownership because of the immediate and on-going need to train staff to maintain two networks (TDM and IP)
- ix. Inability of ITD staff to be responsive in making requested changes quickly and easily such as setting up new offices in a short period of time (e.g., One Start Center; response time would be weeks instead of hours)
- x. Loss of customer service delivery and staff productivity caused by failure of the VoIP Call Manager in a "hybrid" solution and how much longer it takes to route all calls to a secondary Call Manager unit (redundancy and fail-over) and restore services
- xi. Risk to City associated with having to deal with multiple vendors and their respective support teams to resolve network/VoIP problems; high risk of finger-pointing between multiple vendors because no one vendor can be held accountable to resolve the problem
- xii. Risk to the reliability of the City's network because an adequately comprehensive network security solution could not be implemented in

Information Technology Department
Converged Network RFP: Considerations
July 2004

a "hybrid" solution (multiple vendors would have had to provide security features)

2. Risk to the City associated with potential cost for City (owner-caused) delay to NCH move-in schedule if "hybrid" solution did not work, disputes arise between multiple vendors during implementation, or functionality, quality of service, or security design was unsatisfactory when move-in commences
3. Staff support impacts of a "hybrid" solution were deemed unjustifiable in light of the following:
 - i. FY04-05 ITD staffing level now the same as FY98-99, due to staff reductions in recent years
 - ii. FY05-06 revenue projections still showed revenues falling short of expenditures, so the probability of more ITD staffing reductions is deemed "highly likely"
 - iii. Possibility of Council restoring service delivery options using one-time funds and thereby increasing need to identify additional on-going expenditure reductions (further ITD staff reductions) in FY05-06 is deemed "likely"
 - iv. Existing and projected staff capacity is inadequate to absorb the workload associated with establishing, testing, and maintaining interoperability between/among multiple network equipment environments

2. Network standard

The City's Municipal Code (Section 4.12.149) refers to the following when setting a standard:

- A. Repair and maintenance costs minimized
 - B. User/personnel training would be facilitated
 - C. Supplies/spare parts would be minimized
 - D. Modifications to existing equipment would not be necessitated
 - E. Training of repair/maintenance personnel would be minimized
 - F. Matching existing supplies, materials or equipment is required for proper operation of a function or program
1. Confirming the existing standard versus setting a new standard:
 1. City standard, fully compliant with the City's Municipal Code requirements, has been in place due to previous purchases being consistently Cisco
 2. Existing investment in Cisco infrastructure, staffing and training indicates that viable working standard has been in place
 2. A new network standard at this time was not recommended because it would have resulted in:
 1. Higher repair and maintenance costs because the City would have to contract for hardware and software maintenance and licensing for both the City's

Information Technology Department
Converged Network RFP: Considerations
July 2004

existing network equipment as well as the new network equipment provided by another vendor (

- Setting new standard would not comply with Muni. Code Standards Requirement, A. above
2. Higher support and maintenance personnel training costs because the City would have to introduce, configure, test, support, and administer network equipment provided by multiple vendors in addition to the VoIP solution
 - Estimated to be 3 months of on-the-job training for 6-8 people (assuming some level of knowledge of Cisco network equipment) for the new network equipment alone
 - Or, more existing staff from other key projects (e.g., email server consolidation; implementation of Active Directory, new Customer Service model to support departments moving into NCH, PD wireless, New City Hall server/SAN, FMS upgrade, internal investigations, etc.) would have to be redirected in order to support a multi-vendor telecommunications environment in NCH
 - Setting new standard would not comply with Muni. Code Standards Requirement, B. and E. above
 3. Network routers, switches, and security devices between the two sets of equipment would not be interchangeable and a greater variety of spare parts inventory would have to be maintained
 - Setting new standard would not comply with Muni. Code Standards Requirement, C. above
 4. Existing network equipment would have to be modified in order to work with the new network equipment (integration; inter-operability); on-going maintenance effort would be higher because these modifications would have to be re-done every time a network upgrade was performed causing a higher risk of the network not being available as a result
 - Setting new standard would not comply with Muni. Code Standards Requirement, D. above
 5. Cost to change out the City's existing network equipment to bring it into compliance with a new standard for network equipment would be significant, particularly in light of the City's current as well as the projected budget
 6. The proper implementation and operation of the network includes implementation and maintenance of network security end-to-end throughout the entire network. Security parameters typically are set on multiple switches and routers and need to be managed so they provide an entire comprehensive solution. To insure that security throughout the entire network is efficiently and effectively managed, it is best to have identical components with the same security features. By having all of the network components with same

Information Technology Department
Converged Network RFP: Considerations
July 2004

security features, security settings can be managed centrally without the vulnerabilities due to equipment mis-match.

- Setting a new standard would not comply with Muni Code Standards Requirement, F. above

Although, many of the identified strategic benefits will be immediately realized this investment in technology will provide the infrastructure that will allow the City to realize many of the benefits over the life of the facility.

Strategic Benefits

- ① Easier access to Government
- ② Supports 24 hours by 7 days a week (24 X7) operation
- ③ Greater inter-governmental and intra-governmental sharing of information
- ④ Technically empowers employees
- ⑤ Improved internal and external customer service
- ⑥ Enhanced connectivity of Government Operations
- ⑦ More opportunities to share best practice information
- ⑧ Increased employee productivity
- ⑨ Reduced traditional telephone cost
- ⑩ Improved Return On Investment
- ⑪ Better use of IT, network, and human resources
- ⑫ Increased employee moral
- ⑬ Preparedness for any type of emergency
- ⑭ Protection of critical infrastructure
- ⑮ Increased Service Levels with lower budgets
- ⑯ Foundation is created to implement many of the recommendations in the City's Information Technology Master Plan

○ Benefits of Network + VOIP

Cost Savings

- Hard cost savings
 - Server Consolidation
 - Web Server consolidation
 - File and Print server consolidation
 - Authenticating server consolidation
 - Anti-virus server consolidation
 - Home Directory server consolidation
 - DHCP, DNS, WINS server consolidation
 - Miscellaneous Business Application server consolidation
 - In-house phone system
- Soft cost savings
 - Reduction of duplication of effort
 - Shift of staff resources from network and server maintenance and support to direct customer support
 - Better resource utilization
 - Staff has the ability to focus and gain expertise in specific technical areas
 - Standardized and consolidated anti-virus protection
 - Standardized and consolidated DHCP, WINS, and DNS services
 - Standardized and consolidated Print and File services
 - Increased data security
 - Standardized and consolidated virus protection
 - Protection of critical infrastructure
 - Reduced cost and consolidation of hardware and software maintenance cost
 - Managed software licensing requirements

Customer Benefits

- ☐ Increase in productivity due to:
 - ☒ Increase in network availability and network speed improvement
 - ☒ Increase in server availability and server speed improvements
 - ☐ Standardized desktops and ease of learning new products
 - ☐ Availability of collaboration and document sharing services
 - ☐ Improved desktop uptime and shorter desktop downtime by taking advantage of system ability to self repair, remote diagnostics, and newer more stable Operating system and applications
 - ☐ Remote diagnostic tools to assist the customer quickly
 - ☒ Increase and easier implementation of collaboration ability
 - ☐ Video conferencing abilities for meetings and training
 - ☒ Quicker response for moves, adds, and changes for telephones and desktops (Increased staff productivity)
- ☐ Applications accessible through Web interface
- ☐ Implementation and expansion of eGov services
- ☐ Integration of newer systems allow staff more flexibility and resources
- ☒ Wireless telephone availability for designated staff
- ☒ Telephone number can follow users to temporary work locations
- ☐ Streaming video available on wireless devices
- ☐ Ability for remote customers to virtually appear on the NCC network
- ☒ Increased data security
- ☒ Improved access to data from remote locations
- ☐ In building cellular telephone coverage
- ☐ In-building Police, Fire, and other City radio channel coverage
- ☐ Conference room equipment
- ☐ Kiosk availability throughout the complex for public electronic transactions
- ☐ Implements a public WiFi "hotspot" in the New Civic Center complex
- ☒ Ability to broadcast a page type message to designated staff groups on phone system

Technical Benefits

- ☐ Increase in productivity due to:
 - ☐ Standardized desktop environments
 - ☐ Self repairing applications
 - ☐ Remote diagnostic tools
 - ☐ Easier configuration and support
 - ☒ Desktop "ghost" images utilization
 - ☐ Purchase of pre-configured desktops
 - ☒ Best practice implementation of network topology
 - ☒ Integration of telephone and data
 - ☐ Video conferencing abilities for meetings and training
- ☐ Centralized Software Licensing Management
- ☐ Standardized hardware and software purchasing for quicker turn around times
- ☐ Implementation of industry best practices in:
 - ☒ Network Design
 - ☐ Anti-virus configuration
 - ☐ Desktop configuration
 - ☐ Server Configuration
 - ☒ Staff has the ability to focus and gain expertise in specific technical areas
 - ☒ Staff has the ability to gain knowledge in new technologies
 - ☐ Wireless network will enhance service request resolutions
 - ☒ Ability to setup a remote NOC
 - ☐ Fiber connectivity between NCC, oCH, CAE, nMLK, and oMLK
 - ☒ Sets the foundation to expand in-house telephone services to the fiber connected facilities for additional cost reduction and enhancement in services
 - ☒ Enhanced telephone services at a lower cost
 - ☒ Provides a 1 Gigabit data backbone (10 times faster than today's backbone)
 - ☒ Integrates voice, data, and streaming video on the same network
 - ☒ Provides a voice over IP aware network
 - ☐ Provides wireless data connectivity for staff and public
 - ☒ Provides 1 Gigabit data connection to the desktop

- ☐ Implements on-line collaboration opportunities
- ☐ Allows for implementation of video conferencing
- ☒ Provides video streaming capabilities
- ☒ Provides security system integration
- ☐ Consolidation of departmental data and server services
- ☒ Reduction of duplicated data and effort
- ☐ System integrated application will be easier to develop
- ☒ Supports eGov direction
- ☐ All user data is stored on the server so daily backups can be performed
- ☐ Adds an additional Unix cluster for FMS, Peoplesoft, and Data Warehouse usage, which will ease the migration to the New Civic Center and provide additional capacity after the migration
- ☐ Utilizes as much as possible the existing server equipment
- ☐ Implements DHCP, WINS, and DNS services throughout the enterprise
- ☐ Improved Web services
- ☐ Implements asset management and facility helpdesk application
- ☐ Implements Network Storage Solution
 - Reduce Backup and Restore Times
 - Speed application testing and data migration
 - Lower storage costs
 - Safeguard all your information
 - Protect our IT investment